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dictata of consciousness to be the whole sphere of psychology, started with these and reasoned out a complete so-called science, the new psychology modestly starts with physiological experiments, and records the psychological results. It works from without inward. It begins with external conditions which it can control, and, by subjecting these to as exact and accurate measurements as are known in modern science, it observes the corresponding mental phenomena. We can conceive of almost any other criticism being brought against psychophysics than that it is unscientific or inaccurate. Whether it is a fruitful study, or has thus far repaid the immense labor expended upon it, may be questioned; but that it is characterized by the most patient research, the most precise measurements, the most cautious conclusions, and a scientific spirit that the old psychology never approached, cannot be reasonably denied.

As regards the psychophysics law of Weber, under the following statement it has been generally accepted, and found useful and suggestive: "The difference between two excitations, must, in order that the differences in sensation be equally appreciable, grow proportionally to the magnitude of the excitations." The mathematical statement of the same by Fechner—"The sensation grows as the logarithm of the excitation"—has given rise to the question whether differences in sensations can be expressed in terms of quantitative measurements. This objection is urged by Zeller, and rejected by Wundt. It implies the old error of a physical world without, and a spiritual world within, which have nothing in common. While Wundt's position here is theoretically correct, the question may nevertheless be raised, whether, ultimately, differences in sensations are not qualitative rather than quantitative differences.

GEO. T. WHITE.

Science for a livelihood.

I have just read the communications of C. B. of New York and W. F. Flint of New Hampshire in Nos. 188 and 189 of *Science*, under the above heading, in which there is a strain of lament over the frugal table which the field of science has spread for ambitious young men who desire to live, or at least exist, on a purely scientific diet. As I deem the subject of vital interest to nearly every young man with scientific tendencies about to choose a profession, I desire to add a few words.

I graduated in the spring of 1884 from a scientific department of the Kansas state university. After taking a pretty thorough general course of study as an undergraduate, I finished my work by spending two years in the Natural history laboratory, under the direction of Prof. F. H. Snow. If I did not receive a 'good' or 'first-rate scientific education,' I did, at least, master a few principles, and laid a foundation for future work and study. During my last year in the laboratory, I had the refusal of two positions as teacher of natural history, both of which paid good living salaries. Within a year's time after graduation, I was offered three positions, with no salary less than twelve hundred dollars. Meanwhile I had not made a single application for a position.

George F. Gaumer, Annie E. Mozley, and Richard Foster graduated from the same department while I was in the lower classes, and all three have held good positions. Gaumer went to Cuba, then to Yucatan, and afterwards to various parts of Central

America. On his return, after an absence of three years, he reported fine success, particularly in a financial way. He cleared twenty-five hundred dollars by selling specimens of the golden turkey, and increased his finances in various ways as a collecting naturalist. But this was only a small part of his success. He collected many rare birds and insects, some of which were new to science, and returned with a reputation as a rising young naturalist, to receive an appointment as professor of natural history in the University of Santa Fé, New Mexico. Richard Foster speaks for himself as professor of natural history in Howard university, Washington, D.C.

W. C. Stevens graduated from the natural history department in 1885, and immediately received a good position as a teacher of natural history. J. D. McLaren graduated from the same department with the class of '86, and in less than a month's time his scientific training secured him a position as teacher at a hundred and fifteen dollars per month. W. H. Brown, member of the senior class, who has spent but a single year in the department, went to the Smithsonian institute to spend a month of his summer vacation, and learn what he could by observation, expecting to return, however, and resume his work in the laboratory. But, alas! news soon came that his enthusiasm and skill had secured him a good place with increasing wages.

As much, if not more, might be said of the students of the other scientific departments of the university. All the graduates from the 'course in chemistry and physics' are professors enjoying enviable positions as well as good salaries. Many of the advanced undergraduate students from this course hold respectable positions, and receive good wages.

I must be brief as possible, but not so brief as to omit the civil engineering department, the graduates of which receive larger salaries, perhaps, than those laboring in other scientific fields. The most surprising thing about this department is, that there is such a present demand for the young men, that nearly all of them are called into the field to hold responsible positions, and receive remunerative wages before they have finished their work in the department.

As regards the 'wealth' and 'friends' of the young men of whom I have spoken, allow me to say that all of the graduates, with a possible single exception, were farmer boys who earned with their own hands most if not all the money which kept them at the university. And the only 'friends' they had 'to forward them in their chosen fields' were those which industry and good progress won for them in those fields.

I think the facts will bear me out in saying that no class of Kansas young men are doing better, or have more brilliant prospects, than those which have done good work in the scientific departments of the university.

L. L. DYCHE.

Lawrence, Kan., Sept. 20.

Photography of the solar corona.

Accounts have appeared in your journal, of my attempts to photograph the corona of the sun without an eclipse. Many of the plates obtained presented appearances which, not to myself only, but to several scientific men who must certainly be considered to be among those who are exceptionally competent to give an opinion on this point, seemed to be most probably due to the corona. Plates taken in England about

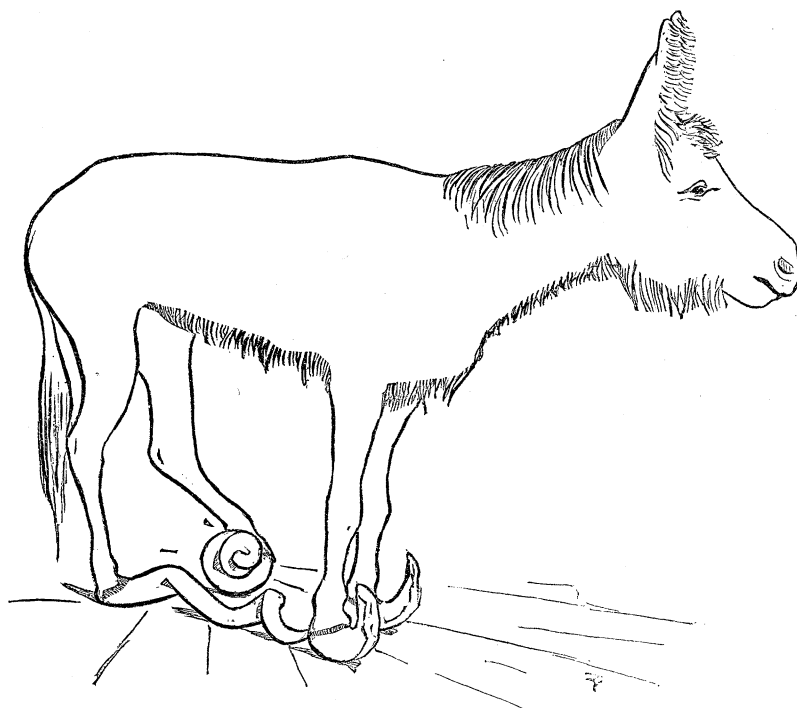
the time of the eclipse of May 6, 1883, and drawn by Mr. Wesley before any information reached this country of the observations of the eclipse, presented not only a general resemblance to those taken during the eclipse, but showed the remarkably formed rift on the east of the sun's north pole, which is the main feature of the corona as photographed at Caroline Island. It is true that since the summer of 1883 I have not been able to obtain in England photographs which show satisfactory indications of the corona; but the abnormally large amount of air-glare from finely divided matter of some sort, which has been present in the higher regions of the air since the

regret greatly that a method which seemed to promise so much new knowledge of the corona, which, under ordinary circumstances of observation, shows itself only during total eclipses, would seem to have failed. At the same time I am not able to offer any sufficient explanation of the early favorable results to which I have referred briefly in the opening sentences of this letter.

Of course, the above statements leave untouched the criticisms I felt called upon to make on the imperfect methods employed by Professor Pickering.

WILLIAM HUGGINS.

Upper Tulse Hill, London S. W., Sept. 11.



AN ASS WITH ABNORMALLY DEVELOPED HOOFS.

autumn of 1883, might well be considered a sufficient cause of the want of success. This well-known state of the sky rendered the plates taken by Mr. Ray Woods in Switzerland in the summer of 1884 inconclusive as to the success of the method. During the past year, photographs of the sun have been taken at the Cape of Good Hope, and are under discussion by Dr. Gill.

Such was the state of things before the eclipse of Aug. 29. The partial phases of this eclipse furnished conditions which would put the success of the method beyond doubt if the plates showed the corona cut off partially by the moon during its approach to and passage over the sun. As the telegrams received from Grenada, and a telegram I have received this day from Dr. Gill at the Cape of Good Hope, state that this partial cutting-off of the corona by the moon is not shown upon the plates, I wish to be the first to make known this untoward result. I

An ass with abnormally developed hoofs.

A pair of very abnormal hoofs has been recently received by the Smithsonian institution from J. C. Baldwin, Esq., of Houston, Tex. They are the hind hoofs of an ass reported to have been bred at San Antonio, Tex., and which was exhibited in Chicago and other cities of the union.

The right hoof is twenty-six inches in length, and is spirally twisted, like the horn of an Indian goat. The left hoof is in the form of a helix.

The front hoofs were not received, but, from the photograph which accompanied the hind pair, it appears that they were also abnormal.

The animal, as it appears in the photograph, is greatly emaciated. The neck and shoulders are clad with rather long, curled hair, while on the posterior half of the body the hair is short and smooth.

F. W. TRUE.

U. S. nat. mus., Sept. 27.